

भारतीय मानक
Indian Standard

वस्त्र प्रसंस्करण सहायक सामग्री —
अल्ट्रामेरीन नील — विशिष्टि
(पहला पुनरीक्षण)

**Textiles Auxiliaries — Ultramarine
Blue — Specification**
(*First Revision*)

ICS 59.040

© BIS 2022



भारतीय मानक ब्यूरो
BUREAU OF INDIAN STANDARDS
मानक भवन, 9 बहादुरशाह ज़फर मार्ग, नई दिल्ली -110002
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI-110002
www.bis.gov.in www.standardsbis.in

December 2022

Price Group 6

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Textile Speciality Chemicals and Dyestuffs Sectional Committee had been approved by the Textiles Division Council.

Ultramarine blue is used extensively in textile industry as a tinting material. It is also used in laundry industry. Use of ultramarine blue enhances the appearance of white, bleached textiles. Ultramarine blue is also used as pigment for paints, for which a separate Indian Standard has been formulated IS 55 : 1970 'Specification for ultramarine blue for paints (*first revision*)'

This standard was first published in 1984. The first revision has been made in the light of experience gained since its publication and to incorporate the following major changes:

- a) Title of the standard has been modified;
- b) Amendment 1 has been incorporated in the standard;
- c) Packaging and marking clause have been modified;
- d) BIS certification marking clause has been modified; and
- e) References to Indian Standard given in Annex A has been updated.

The composition of the Committee responsible for the formulation of this standard is listed in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard
TEXTILE AUXILIARIES — ULTRAMARINE BLUE —
SPECIFICATION
(First Revision)

1 SCOPE

This standard covers ultramarine blue used as tinting material in textile applications.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards.

3 REQUIREMENTS**3.1 Composition**

3.1.1 The ultramarine blue shall be a complex of sodium aluminium sulposilicate. It shall be dry powder, free from lumps, visible impurities and any foreign matter.

3.2 Identification

3.2.1 Warm gently approximately 0.1 g of the material in about 10 ml of 1 : 1 (v/v) hydrochloric acid in a test tube for about 10 minutes. The material shall be ultramarine blue if the colour of the solution is destroyed completely with the evolution of hydrogen sulphide gas. This may be detected by placing lead acetate paper at the mouth of the test tube which turns brown. The presence of any colour in the solution will indicate presence of foreign matter.

3.3 The ultramarine blue shall conform to the requirements given in Table 1 and in **3.4.1**.

3.4 Sealed Sample

If, in order to specify the tint of the ultramarine blue, a sample has been agreed upon between the buyer and the seller and sealed, the supply shall be in conformity with the sample in this respect.

3.4.1 The tint of ultramarine blue shall be measured either instrumentally or visually by the methods prescribed in Annex B. When the tint is measured instrumentally, the average colour difference (ΔE) between the tinted and untinted standard cotton cloth shall be between 9 and 11. When the tint is measured visually with the grey scale for evaluating staining the overall average numerical grey scale rating for staining of tinted fabric by at least three experienced graders shall be either 3 or 3-4 or 4 for each specimen tested.

4 PACKING AND MARKING

4.1 Packing — The ultramine blue shall be suitably packed, as agreed to between the buyer and the seller.

4.2 Marking — The containers shall be marked with the following:

- a) Name of the material;
- b) Net weight;
- c) Lot and batch number;
- d) Month and year of manufacture;
- e) Manufacturer's name, initials or trade-mark, if any; and
- f) Any other information required by the law in force.

Table 1 Requirements of Ultramarine Blue
(Clause 3.3)

Sl No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
1	Matter soluble in water, percent, <i>Max</i>	2.0 (see NOTE)	IS 33 (Hot or cold method)
2	Volatile matter, percent, <i>Max</i>	1.5	– do –
3	Residue on IS sieve 63 micron, percent, <i>Max</i> [see IS 460 (Part 1)]	0.8	– do –
4	Soluble organic colouring matter: a) 10 percent acetic acid b) Test 4 N NaOH test	To pass the test	Annex B

NOTE — Water extract shall be colourless.

4.2.1 BIS Certification Marking

The product(s) conforming to the requirements of this standard may be certified as per the conformity assessment schemes under the provisions of the Bureau of Indian Standards Act, 2016 and the Rules and Regulations framed

thereunder, and the product(s) may be marked with the Standard Mark.

5 SAMPLING

5.1 Representative samples of the material shall be drawn as prescribed in IS 33.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 33 : 1992	Inorganic pigments and extenders for paints — Methods of sampling and tests (<i>third revision</i>)	IS 1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)
IS 55 : 1970	Specification for ultramarine blue for paints (<i>first revision</i>)	IS 1963 : 1981	Methods for determination of threads per unit length in woven fabrics (<i>second revision</i>)
IS 323 : 2009	Rectified spirit for industrial use — Specification (<i>second revision</i>)	IS 3442 : 1980	Method for determination of crimp and count of yarn removed from fabrics (<i>first revision</i>)
IS 460 (Part : 1) 2020	Test sieves — Specification Part 1 Wire cloth test sieves (<i>fourth revision</i>)	IS/ISO 105 A03 : 2019	Textiles — Tests for colour-fastness Part A03 Grey scale for assessing staining (<i>first revision</i>)

ANNEX B

(Table 1)

TEST FOR SOLUBLE ORGANIC COLOURING MATTER

B-0 GENERAL

B-0.1 To a boiling solution of the material in ethanol, sodium hydroxide solution and acetic acid are added separately and examined for any development of colour.

B-1 REAGENTS

B-1.1 Ethanol — 35 percent (v/v), conforming to IS 323.

B-1.2 Acetic Acid — 10 percent (v/v).

B-1.3 Sodium Hydroxide Solution — Approximately 4 N.

B-2 PROCEDURE

B-2.1 Add 1 g of ultramarine blue to 100 ml of ethanol in a beaker. Heat the beaker in a hot water bath (preferably electrically heated) and bring the solution to boil.

NOTE — No naked flame or hot plate should be used for boiling the material with ethanol in order to avoid hazard.

B-2.2 Divide the boiling solution into two parts and pour the same in two test tubes. To one of the test tubes add 1 ml of acetic acid. [10 percent (v/v)] and to the other test tube add 1 ml of sodium hydroxide solution (4 N). Observe the colour of the liquid in both the test tubes.

B-2.3 The material shall be deemed to have passed this test if the liquids remain colourless in both the test tubes.

ANNEX C
(Clause 3.4.1)

METHOD FOR ASSESSING TINT OF ULTRAMARINE BLUE

C-1 PRINCIPLE

C-1.1 A specimen of a standard cotton cloth is tinted with 0.1 percent (*m/v*) aqueous solution of ultramarine blue. The minimum percent reflectance of the tinted specimen and another untinted specimen of standard cotton cloth is measured by a spectrophotometer selecting suitable wavelength in the region 400-700 nm at an interval of 20 nm and the colour difference is calculated with the help of tristimulus values (*x*, *y*, *z*) which in turn may be obtained from the reflectance values (see C-5.5).

C-2 APPARATUS

C-2.1 A Spectrophotometer

C-2.2 An Electric Iron

C-2.3 A Laboratory Scale Padding Mangle

C-2.4 Grey scales for evaluating staining

C-3 MATERIALS

C-3.1 Standard Cotton Cloth — It shall be a desized, scoured and bleached cotton cloth conforming to the constructional requirements given in Table 2. The cloth shall be free from any sizing or finishing material and optical brightening agents.

C-3.2 Glass Wool and Cotton Filter Plugs

Table 2 Constructional Details of Standard Cotton Cloth
(Clause C-3.1)

Count of Yarn, tex (Cotton Count)		No. of Threads per dm	
Warp	Weft	Warp	Weft
410 ± 5 percent (42 ^s ± 5 percent)	410 ± 5 percent (42 ^s ± 5 percent)	390 + 5 percent – 2.5 percent	290 + 5 percent – 2.5 percent
Method of test -----IS 3442-----		-----IS 1963-----	

C-3.3 Distilled Water — (see IS 1070).

C-4 PREPARATION OF TEST SPECIMENS

C-4.1 Cut two specimens of standard cotton cloth (see C-3.1) each of size 20 cm × 30 cm and iron them to remove wrinkles and creases.

C-5 PROCEDURE FOR INSTRUMENTAL ASSESSMENT OF TINT

C-5.1 Prepare 0.1 percent (*m/v*) solution of ultramarine blue under test by pasting the required

quantity of it with a little distilled water and then making up to the desired volume with warm distilled water. Filter the solution successively through a glass wool and cotton plug.

C-5.2 Pad one of the test specimen (see C-4.1) dry in 0.1 percent (*m/v*) solution of ultramarine blue in a laboratory scale padding mangle and squeeze the padded specimen to 80 percent pick up. Dry the specimen by hanging in air at a temperature not exceeding 60 °C.

C-5.3 Find out the minimum percent reflectance of the tinted specimen as obtained in **C-5.2** on a spectrophotometer selecting suitable wavelength in the region 400 nm to 700 nm at an interval of 20 nm at four different places of the specimen and then find out the average of these four readings.

C-5.4 Find out the average minimum percent reflectance of the untinted test specimen (*see C-4.1*) as described in **C-5.3**.

C-5.5 Calculate the colour difference, ΔE between the tinted and the untinted test specimens by the formula:

$$\Delta E = [(\Delta L)^2 + (\Delta a)^2 + (\Delta b)^2]^{1/2}$$

Where

$$L = 25 \left[\frac{100 Y}{Y_o} \right]^{1/2} - 16;$$

$$a = 500 \left[\left(\frac{x}{x_o} \right)^{1/2} - \left(\frac{y}{y_o} \right)^{1/2} \right], 0 \leq \frac{y}{y_o} \leq 1$$

$$b = 200 \left[\left(\frac{y}{y_o} \right)^{1/2} - \left(\frac{z}{z_o} \right)^{1/2} \right];$$

$$\Delta L = L(\text{treated sample}) - L(\text{untreated sample});$$

$\Delta a = a$ (treated sample) — a (untreated sample);
 $\Delta b = b$ (treated sample) — b (untreated sample);
 and X_o , Y_o , Z_o are the tristimulus values of the white object colour stimulus for illuminant used.

For example:

for D65, $X_o = 95.019\ 43$,
 $Y_o = 100.00$, and
 $Z_o = 108.823\ 74$.

C-5.6 Report — Report the sample of ultramarine blue to have passed this test if the value of colour difference, ΔE obtained meets the requirements as specified in **3.4.1**.

C-6 PROCEDURE FOR VISUAL ASSESSMENT OF TINT

C-6.1 Follow the procedure given in **C-5.1** and **C-5.2**.

C-6.2 Evaluate the numerical rating for staining of the tinted fabric specimen with the help of grey scale for evaluating staining by the method prescribed in IS/ISO 105-A03. The assessment of the numerical rating for staining shall be done by at least three experienced graders and the overall average rating shall be reported.

ANNEX D*(Foreword)***COMMITTEE COMPOSITION**

Textile Speciality Chemicals and Dyestuffs Sectional Committee, TXD 07

<i>Organization</i>	<i>Representative(s)</i>
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	PROF A. K. SAMANTA (<i>Chairperson</i>)
Ahmedabad Textile Industry's Research Association,	SHRIMATI DEEPALI PLAWAT SHRIMATI FAHIMUNNISA KHATIB (<i>Alternate</i>)
Ama Herbals Laboratories Pvt Ltd, Lucknow	SHRI Y. A. SHAH
Archroma India Pvt Limited, Mumbai	SHRI RAJESH RAMAMURTHY SHRI ASHIM GHOSH (<i>Alternate</i>)
Atul Limited (Colors Business), Valsad	SHRI V. R. SAI GANESH SHRI ARINDAM CHAKRABORTY (<i>Alternate</i>)
Bio Dyes India Pvt Ltd, Goa	DR BOSCO HENRIQUES
Central Coir Research Institute, Alappuzha	SHRIMATI ANITA JACOB SHRIMATI SUMI SABESTIAN (<i>Alternate</i>)
ICAR – Central Institute for Research on Cotton Technology, Mumbai	DR SUJATA SAXENA DR A. S. M. RAJA (<i>Alternate</i>)
Department for Jute and Fibre Technology Institute of Jute Technology, University of Calcutta, Kolkata	DR D. DAS
Global Organic Textile Standard, (GOTS), Thane	SHRI RAHUL BHAIKAR MS PRACHI GUPTA (<i>Alternate</i>)
Indian Jute Industries Research Association, Kolkata	DR S. K. CHAKRABARTI SHRI SANDIP BASU (<i>Alternate</i>)
Northern India Textile Research Association, Ghaziabad	DR M. S. PARMAR
Office of the Textile Commissioner, Mumbai	SHRI GAURAV GUPTA SHRI SANJAY CHARAK (<i>Alternate</i>)
SGS India Pvt Ltd, Mumbai	SHRI KARTHIKEYAN K. SHRI GAURAV SARASWAT (<i>Alternate</i>)
Shree Pushkar Chemicals & Fertilizers Ltd, Mumbai	DR N. N. MAHAPATRA
Textiles Committee, Mumbai	SHRI KARTIKEYA DHANDA SHRIMATI SHILPI CHAUHAN (<i>Alternate</i>)

IS 11217 : 2022

<i>Organization</i>	<i>Representative(s)</i>
The Arvind Mills Limited, Ahmedabad	SHRI RAJARSHI GHOSH SHRI UMASANKAR MAHAPATRA (Alternate)
The Bombay Textile Research Association, Mumbai	DR PADMA S. VANKAR SHRI M. P. SATHIANARAYANAN (Alternate)
The South India Textile Research Association, Coimbatore	DR PRAKASH VASUDEVAN SHRI S. SIVAKUMAR (Alternate)
The Synthetic and Art Silk Mills Research Association, Mumbai	SHRIMATI (DR) MANISHA MATHUR SHRIMATI ASHWINI SUDAM (Alternate)
U P Textile Technology Institute, Kanpur	DR ARUN PATRA
Wool Research Association, Thane	SHRIMATI SMITA BAIT SHRIMATI (DR) MRINAL CHOUDHARI (Alternate)
BIS Directorate General	SHRI J. K. GUPTA, SCIENTIST 'E'/DIRECTOR AND HEAD (TEXTILES DEPARTMENT) [REPRESENTING DIRECTOR GENERAL (<i>Ex-officio</i>)]

Member Secretary
SHRI HIMANSHU SHUKLA
SCIENTIST 'B'/ASSISTANT DIRECTOR
(TEXTILES DEPARTMENT), BIS

Bureau of Indian Standards

BIS is a statutory institution established under the *Bureau of Indian Standards Act, 2016* to promote harmonious development of the activities of standardization, marking and quality certification of goods and attending to connected matters in the country.

Copyright

BIS has the copyright of all its publications. No part of these publications may be reproduced in any form without the prior permission in writing of BIS. This does not preclude the free use, in the course of implementing the standard, of necessary details, such as symbols and sizes, type or grade designations. Enquiries relating to copyright be addressed to the Head (Publication & Sales), BIS.

Review of Indian Standards

Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the website- www.bis.gov.in or www.standardsbis.in.

This Indian Standard has been developed from Doc No.: TXD 07(17971).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 2323 0131, 2323 3375, 2323 9402

Website: www.bis.gov.in

Regional Offices:

Telephones

Central: 601/A Konnectus Tower-I, 6th Floor
DMRC Building, Bhavbhuti Marg, New Delhi 110 002

2323 7617

Eastern: 8th Floor, Plot No. 7/7 & 7/8, CP Block, Sector V
Salt Lake, Kolata 700091

236 7012, 2320 9474

Northern: Plot No. 4A, Sector 27-B, Madhya Marg
Chandigarh 160 019

265 0206, 265 0290

Southern: C I T Campus, IV Cross Road, Taramani
Chennai 600 113

2254 1442, 2254 1216

Western: Plot No. E-9, Road No. 8, MIDC, Andheri (East)
Mumbai 400 093

28218093

Branches: AHMEDABAD, BENGALURU, BHOPAL, BHUBANESHWAR, CHANDIGARH, CHENNAI, COIMBATORE, DEHRADUN, DELHI, FARIDABAD, GHAZIABAD, GUWAHATI, HIMACHAL PRADESH, HUBLI, HYDERABAD, JAIPUR, JAMMU & KASHMIR, JAMSHEDPUR, KOCHI, KOLKATA, LUCKNOW, MADURAI, MUMBAI, NAGPUR, NOIDA, PANIPAT, PATNA, PUNE, RAIPUR, RAJKOT, SURAT, VISHAKHAPATNAM.